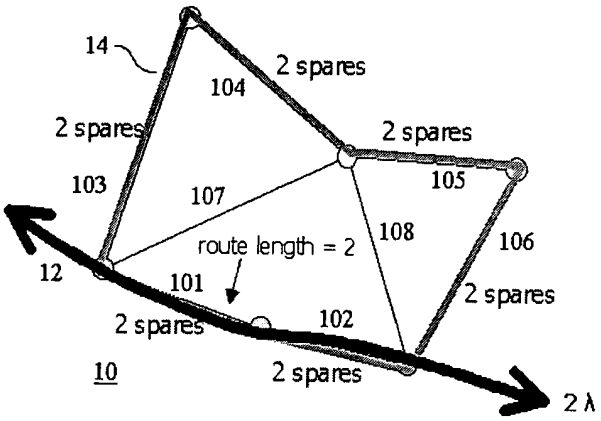


Fig. 1(a)

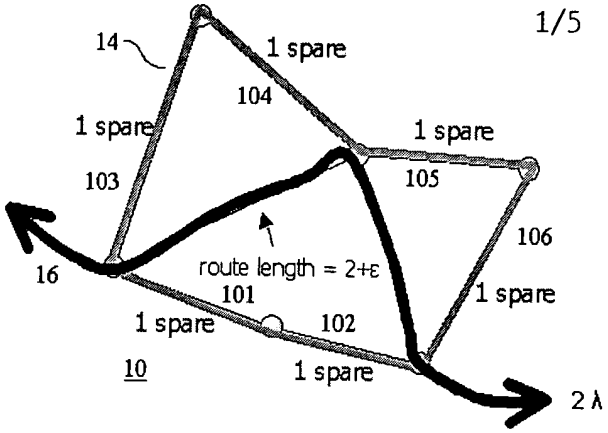


Fig. 1(b)

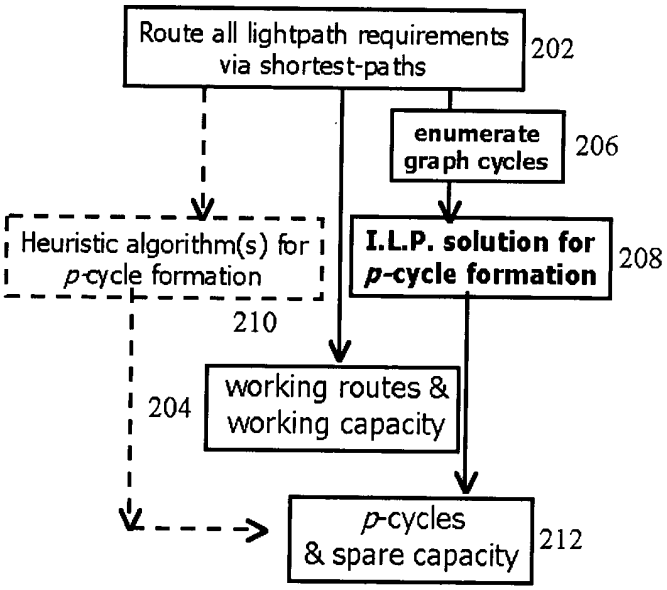


Fig 2(a)

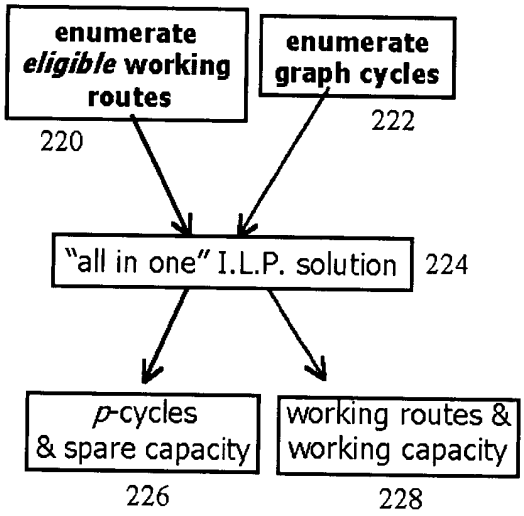
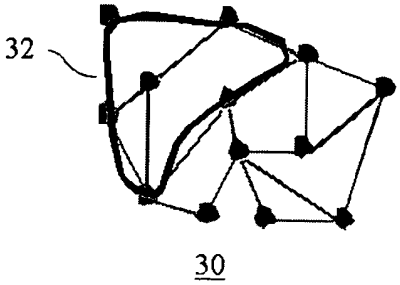
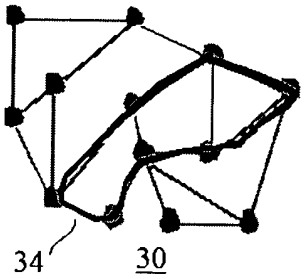


Fig 2(b)



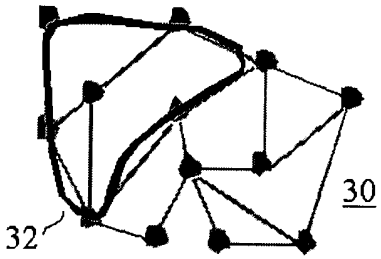
6 spans, all on-cycle
(equiv. To a ring)
TS= 6

Fig. 3(a)



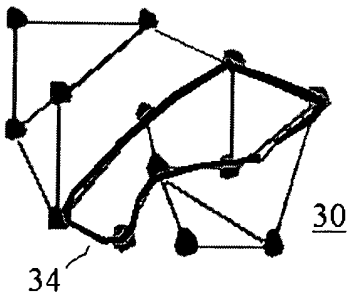
7 spans on-cycle
2 straddlers
TS = 7 + 2*2 = 11

Fig. 3(b)



TS= 6
Cost = 6 hops
--> AE = 1

Fig. 4(a)



TS= 11
Cost = 7 hops
--> AE = 1.57

Fig. 4(b)

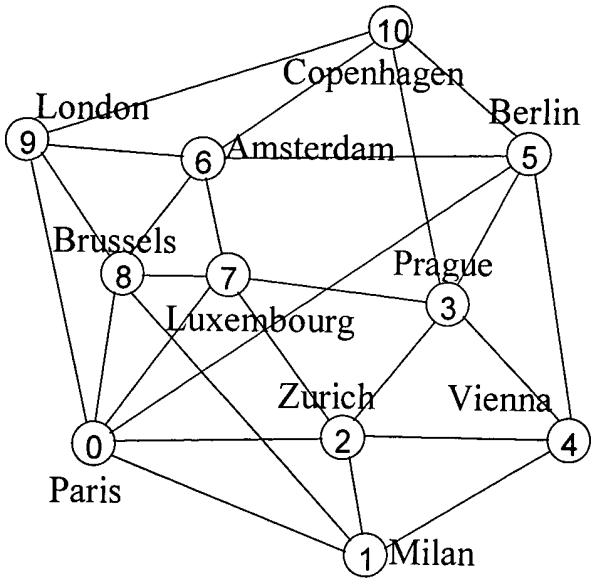

10
Copenhagen
London
Berlin
9
6
Amsterdam
5
Brussels
8
7
Prague
3
Luxembourg
Zurich
Vienna
0
2
4
Paris
1
Milan

Fig. 5

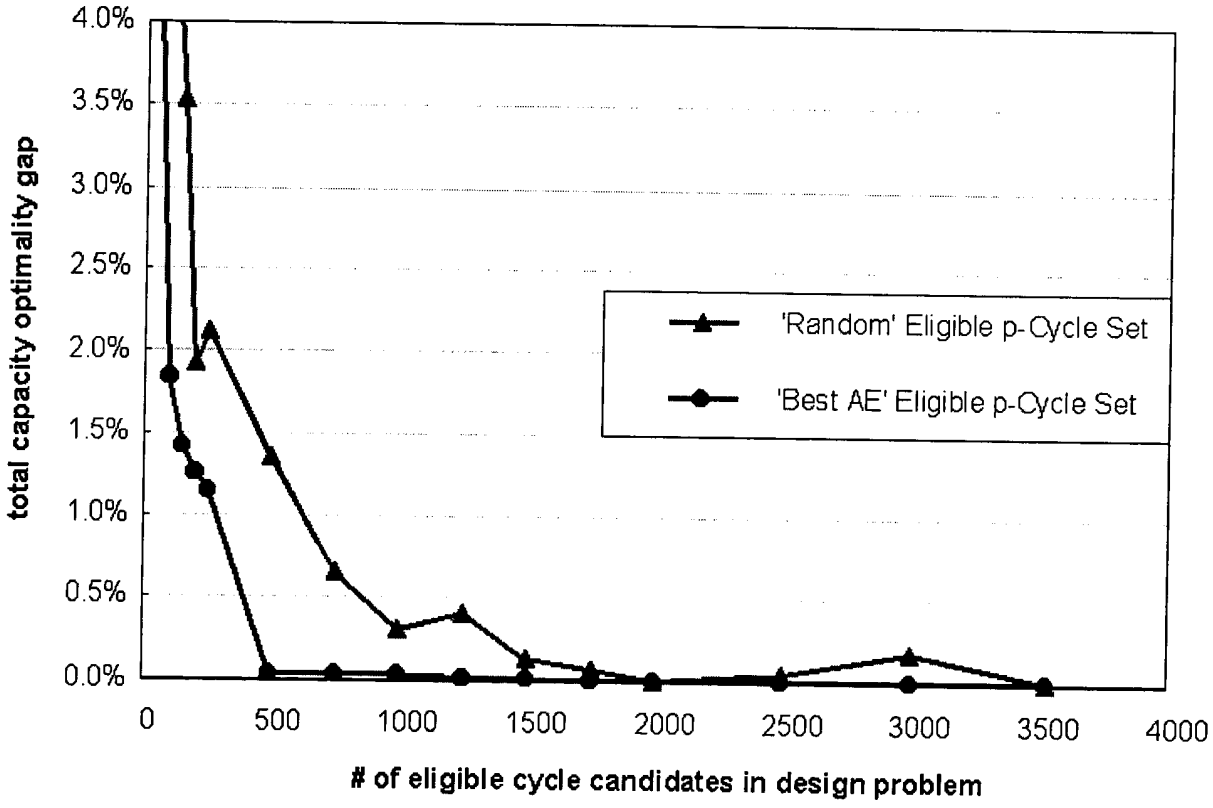

4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
total capacity optimality gap
'Random' Eligible p-Cycle Set
'Best AE' Eligible p-Cycle Set
0
500
1000
1500
2000
2500
3000
3500
4000
# of eligible cycle candidates in design problem

Fig. 6

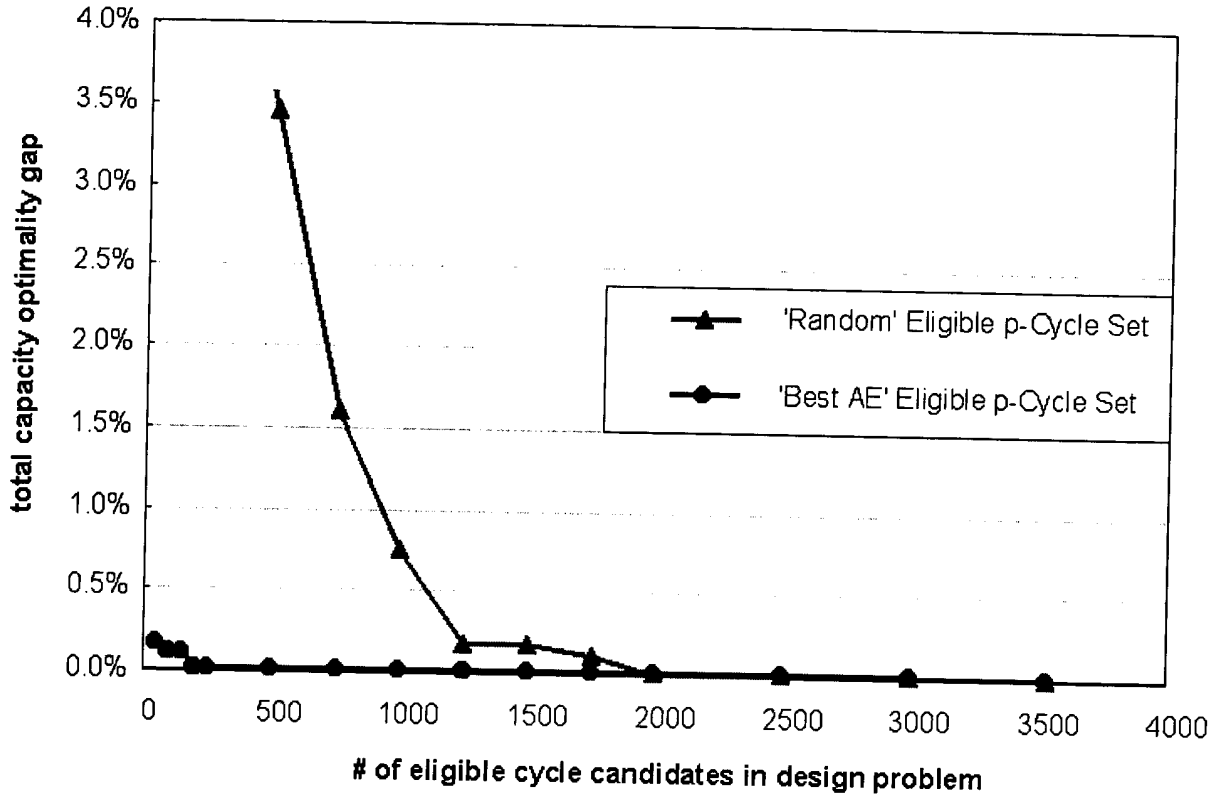

4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
total capacity optimality gap
'Random' Eligible p-Cycle Set
'Best AE' Eligible p-Cycle Set
0
500
1000
1500
2000
2500
3000
3500
4000
# of eligible cycle candidates in design problem

Fig. 7

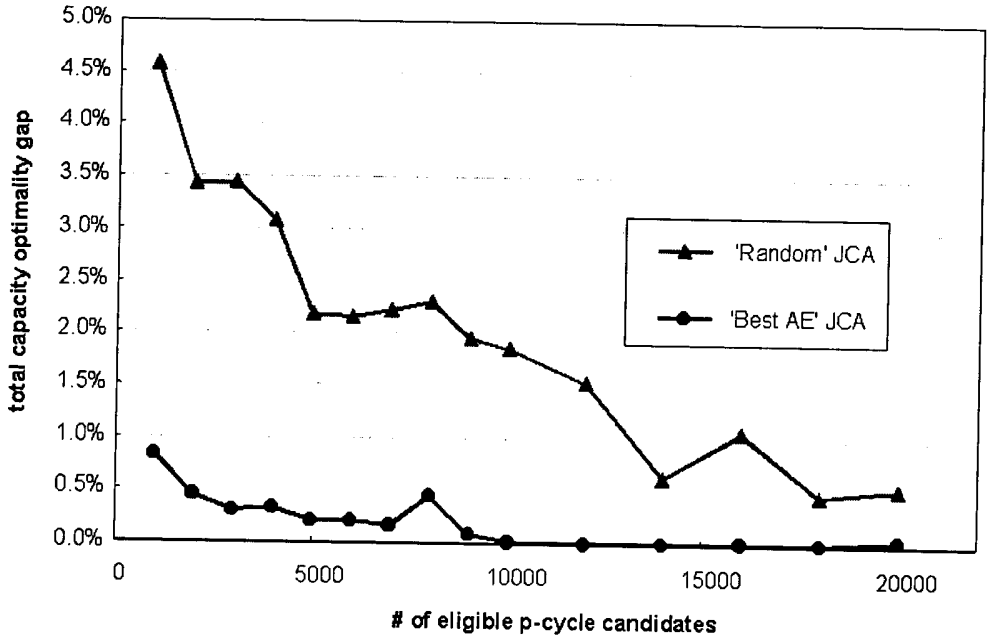

5.0%
4.5%
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
total capacity optimality gap
'Random' JCA
'Best AE' JCA
0
5000
10000
15000
20000
# of eligible p-cycle candidates

Fig. 8

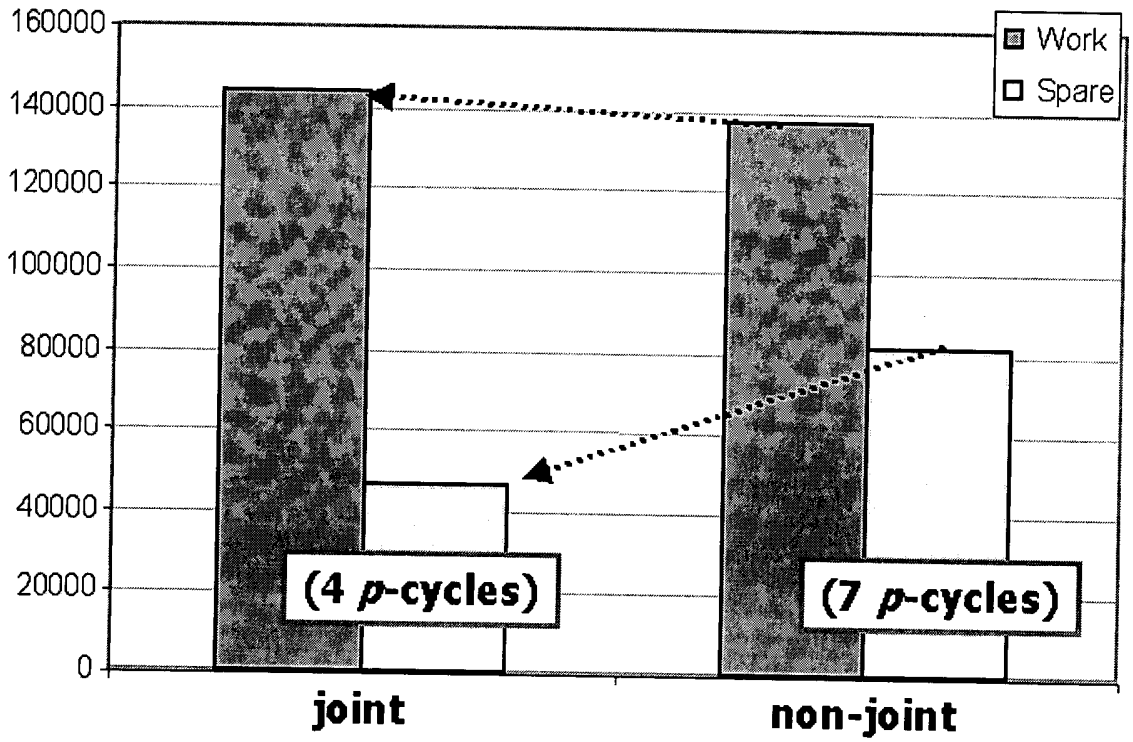

160000
140000
120000
100000
80000
60000
40000
20000
0
Work
Spare
(4 p-cycles)
(7 p-cycles)
joint
non-joint

Fig. 9